MPE Analysis Report

The Equipment Under Test (EUT) is a portable 2.4GHz Transceiver (Plane Unit) for a RC plane operate from 2407-2440MHz with 1MHz channel spacing and the EUT operates in a frequency range from 2412MHz to 2462MHz at WiFi 802.11b,g (11 channels with 5MHz spacing). The EUT is powered by 1 X 3.7V rechargeable battery. After switch on the EUT and paired with RC Controller, the EUT can be controlled to fly forward, backward, turning left/right direction by the controller. Also, the EUT can pair with smart device that for live streaming for the camera on EUT. Photo shooting and video recording can be operated through the App installed on smart device.

WiFi Module
Antenna Type: Internal, Integral
Antenna Gain: 0dBi

Operating mode	Nominal Conducted Power	Production Tolerance	Modulation Type
802.11b	18.71 dBm	+/- 2dB	DSSS
802.11g	15.95 dBm	+/- 2dB	OFDM

2.4GHz RF Module
Antenna Type: Internal, Integral
Antenna Gain: 0dBi

Operating mode	Nominal Conducted Power	Production Tolerance	Modulation Type
2.4GHz RF Module	86.7dBμV/m at 3m	+/- 3dB	GFSK

For Maximum Permissible Exposure (MPE) evaluation of the 44578RX, the maximum power density at 20 cm from this mobile transmitter shall be less than the General Population / Uncontrolled MPE limit in OET Bulletin 65.

1) For the WLAN (WiFi), maximum conducted power measured within its production tolerance was 16.68dBm (maximum). The antenna gain is 0 dBi = 1 (num gain) and the maximum source-based time-averaging duty factor is 100%. From these data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna can be calculated according to OET Bulletin 65 as follow:

The conducted power = 20.71dBm (117.76mW)

The radiated (EIRP) source-based time-averaging output power (with antenna gain)
= (117.76 * 1 * 1) mW
= 117.76 mW

The power density at 20 cm from the antenna
= EIRP / 4πR^2
= 0.0234 mW cm-2

2) For the 2.4GHz RF Module, maximum field strength measured within its production tolerance was 89.7 dBμV/m (maximum). The distance (D) between the antenna and the equipment under test (EUT) was 3 meters. And the maximum source-based time-averaging duty factor is 100%. From these data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna can be calculated according to OET Bulletin 65 as follow:

The radiated power = (FS*D)^2 / 30 = 0.28 mW

The radiated (EIRP) source-based time-averaging output power
= (0.28 * 1) mW
=0.28 mW

The power density at 20 cm from the antenna
= EIRP / 4πR^2
= 0.000056 mW cm-2

In the frequency range of 1,500 - 100,000MHz, the MPE limit is 1.0 mWcm-2 for general population and uncontrolled exposure. As the measured power density at 20cm from the transmitter is lower than the MPE limit, the compliance to the MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structures and body of the user or nearby persons.
The following RF exposure statement is proposed to be included in the user manual:

“ FCC RF Radiation Exposure Statement
Caution: To maintain compliance with the FCC’s RF exposure guidelines, place the product at least 20cm from nearby persons.”

In addition, for this product with multiple transmitter and antenna (Bluetooth and WiFi), the requirement of Simultaneous Transmission evaluation has also been considered and has complied with the following conditions of the worse case;

MPE1/Limit1 + MPE2/Limit2 ≤ 1

Thus,

0.0234 /1 + 0.000056/1 = 0.023456 ≤ 1
WiFi 2.4GHz RF

It is concluded that no Simultaneous Transmission evaluation is required.